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PHYSIOLOGICAL DEMANDS OF LAW ENFORCEMENT OCCUPATIONAL TASKS IN AUSTRALIAN POLICE

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BLUF

The routine operational tasks attended by police officers can place high demands on their cardiorespiratory systems even during seemingly sedentary tasks, like driving, where heart rates can breach maximum predicted values.

INTRODUCTION

Research suggests that law enforcement is primarily a sedentary occupation.^[1,2] However, officers may have to respond rapidly to unpredictable situations ^[3] and this can dramatically increase their physiological loads.^[4] Police officers are twice as likely to develop cardiovascular disease when compared to the general population ^[2] The aim of this study was to investigate the physiological demands placed on Australian state police officers carrying out operational tasks.

METHODS

- A cross sectional study design was used to investigate the physiological stress associated with operational tasks routinely performed by 40 uniformed police officers (mean±SD age=33.58±7.78 yrs, height=177.70±7.28 cm, weight=85.68±14.52 kg, yrs of service=6.74±6.29 yrs).
- Recruited from nine different police stations, and following a familiarization session, each officer completed two to four consecutive work shifts wearing a monitoring harness and data-logging device, with heart rate (HR) collected via a 2-lead ECG from the Equivital (Equivital Eq-02, Hidalgo, UK).
- Non-identifiable data on task types undertaken by these police officers during shifts were extracted from a Computer Aided Dispatch (CAD) system.
- Data from the Equivital system were imported, synchronised and merged into VivoSense (v2.7, Vivonoetics, USA) and then, with the CAD data, imported into SPSS (v.20).
- The top four most frequently attended task types were then identified and subjected to further analyses. Differences in HR, %HR maximum and respiratory rates (RR) between tasks were examined using ANOVA. Significance was set at .05, *a priori*.
- Ethics approval for the study was given by the Bond University Human Research Ethics Committee (RO 1893).

RESULTS

- Means, standard deviations and ranges for all measures are shown in Table 1.
- The four most frequently attended task types were: ‘**check bonafides**’ (n=76; 22%), ‘**driving urgently**’ (n=45; 13%), ‘**a domestic incident**’ (n=37; 10%) and ‘**a concern for welfare**’ (n=30; 8%).
- While no significant differences were found between the four task types (p>0.05) in the physiological measures, there were **multiple occasions** where **individual HR were near, at, or above their predicted maximum**, including:
 - a 40-year-old male officer who **breached his predicted maximum HR** during three separate calls within one day,
 - two officers’ HR ranging from **188 to 209 b.p.m.** on four separate occasions, and
 - four officers (one call out) ‘**driving urgently**’ to a ‘domestic incident’, who all recorded concerning HR, ranging from **185 to 198 b.p.m.**

Task	HR Mean ± SD (Range) BPM	%HR Max Mean ± SD (Range) %	RR Mean ± SD (Range) Breaths/minute	Duration Mean ± SD (Range) Minutes
Check bonafides	86±12.79 (58-204)	47±7.18 (39-111)	23±5.60 (10-39)	14±11.05 (1-46)
Driving urgently	91±17.20 (48-198)	50±9.35 (40-115)	24±6.12 (12-39)	5±5.84 (1-38)
Attending a concern for welfare	87±10.44 (40-198)	47±6.41 (53-111)	22±5.52 (18-27)	11±10.43 (1-44)
Attending a domestic incident	92±15.97 (40-214)	49±8.78 (40-116)	22±3.83 (16-28)	23±30.09 (2-134)

Table 1. Physiological measures from the top four tasks:

DISCUSSION

Police officers endure numerous physiological challenges throughout their working day and on occasions can have heart rates exceeding maximum predicted heart rates. This cardiovascular strain is of concern given their greater risk of cardiovascular disease.



PRACTICAL APPLICATION

Strength and conditioning coaches need to ensure active steps are taken to develop, **maintain and monitor cardiovascular health** in conjunction with **other forms of performance conditioning** when training police officers.

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